REMARKS

This application has been reviewed in light of the Office Action dated July 6, 2007. Claims 1-11 are presented for examination, of which Claims 1, 6 and 11 are in independent form. Claims 1, 4-6 and 9-11 have been amended to define still more clearly what Applicant regards as his invention (Applicant notes that these claims have been amended to correspond to the claims that have been allowed in Applicant's counterpart Japanese application). Claims 12 and 13 have been cancelled without prejudice and disclaimer of subject matter, and will not be mentioned further. Favorable reconsideration is respectfully requested.

In the outstanding Office Action, Claims 1-4, 6-9 and 11 were rejected under 35 U.S.C. § 103(a) as being obvious from U.S. Patent 6,330,075 (Ishikawa) in view of U.S. Patent 5,801,855 (Ohta), and Claims 5 and 10 were rejected under Section 103(a) as being obvious from those two patents in view of U.S. Patent Application Publication 2005/0031199 (Ben-Chorin et al.).

Users of an image processing apparatus such as a printer require various color representations, and thus the total number of combinations of dot patterns used in the color diffusion processing can be quite large if a printer must accommodate the needs of several users. As a result, the scale of the circuits needed in the image processing apparatus to store and use these various combinations of dot patterns increases correspondingly. An object of the present invention is to avoid this increase in circuit scale of the image processing apparatus.

More specifically, independent Claim 1 is directed to an image processing apparatus that comprises a converter, arranged to color-convert input image data using a

three-dimensional table selected from a plurality of three-dimensional tables and an interpolation process. The plurality of three-dimensional tables include three-dimensional tables in correspondence with a color appearance of an image to be printed by the dot pattern. A first calculator is provided to obtain error-corrected data by adding error data to the color-converted image data, and an output section selects a dot pattern from a combination of dot patterns selected from a plurality of combinations of dot patterns based on the error-corrected data, and outputs the selected dot pattern. In addition, an obtaining section obtain data that indicates an output color corresponding to the output dot pattern, by referring to an output density table, and a second calculator obtains the error data by calculating a difference between the data which indicates the output color, and the color-converted image data.

Among other notable features of an apparatus according to Claim 1 are that (i) input image data is color-converted by using a three-dimensional table selected from a plurality of thee-dimensional tables and an interpolation process, (ii) error-corrected data is calculated by adding error data to the color-converted image data, (iii) a dot pattern is selected from a combination of dot patterns, which are selected from a plurality of combinations of dot patterns, based on the error-corrected data to output the selected dot pattern, (iv) data, which indicates an output color corresponding to the output dot pattern, is obtained by referring an output density table, and (v) the error data is obtained by calculating a difference between the data which indicates the output color, and the color-converted image data, in other words, the color diffusion processing is performed. Further, the plurality of three-dimensional tables include three-dimensional tables in correspondence with a color appearance of an image to be printed by the dot pattern.

In an apparatus constructed according to Claim 1, the plurality of three-dimensional tables can include various three-dimensional tables such as one having a conversion characteristic that increases the contrast of a middle luminance, another that has a conversion characteristic that increases a saturation of a specific hue, and the like. In this way, therefore, various color representations required by the users can be realized without a change of table for the color diffusion processing or a change of the dot patterns.

For example, when the error-corrected data has three color components and the dot pattern to be used is selected in accordance with three significant bits of the error-corrected data, there are 23 x 3 = 512 combinations of dot patterns. Further, if two characteristics of printers, two printing methods, two characteristics of recoding materials, and two characteristics of print media exist, then no fewer than eight combinations of dot patterns need to be prepared, in other words, 8 x 512 = 4,096. Additionally, if the user requires both a conversion characteristic that increases contrast of the middle luminance and a conversion characteristic that increases the saturation of a specific hue, in addition to the standard conversion characteristics, the number of the dot patterns to be prepared is 3 x 8 x 512 = 12,288. In contrast, according to the aspect of the present invention set out in Claim 1, the standard conversion characteristics and the above conversion characteristics required by the user can be realized by preparing three corresponding three-dimensional tables, each of which corresponds to one of the required conversion characteristics, without increasing the number of dot patterns. Thus, it is possible to avoid increasing the circuit scale of the image processing apparatus, while yet providing various color representations required by the users.

Ishikawa, as noted by the Examiner, does not teach color conversion using a three-dimensional table and an interpolation process, and the Examiner cites *Ohta* for those features. The Examiner notes, particularly, conversion circuit 12 in *Ohta* that uses a three-dimensional table stored in a table memory 63 and an interpolation circuit 65 (Figs. 1 and 2). Applicant submits, however, that in *Ohta* the table memory 63 is not disclosed as including three-dimensional tables in correspondence with a color appearance of an image to be printed by a dot pattern, as is recited in Claim 1. In other words, *Ohta* does not teach that a plurality of three-dimensional tables should include various three-dimensional tables such as a three-dimensional table having a conversion characteristic that increases contrast of a middle luminance, a three-dimensional table having a conversion characteristic that increases a saturation of a specific hue, and the like. Accordingly, even if it would be proper to combine *Ishikawa* and *Ohta* in the manner proposed in the Office Action, the result of such combination would not have this feature of Claim 1.

Claims 6 and 11 are a method and a comptuer-medium claim, respectively, corresponding to apparatus Claim 1, and are deemed allowable over *Ishikawa* and *Ohta* for the same reasons as discussed above with regard to Claim 1.

A review of the other art of record has failed to reveal anything which, in Applicant's opinion, would remedy the deficiencies of the art discussed above, as references against the independent claims herein. Those claims are therefore believed patentable over the art of record.

The other claims in this application are each dependent from one or the other of independent Claims 1 and 6, and are therefore believed patentable for the same reasons. Since each dependent claim is also deemed to define an additional aspect of the

invention, however, the individual reconsideration of the patentability of each on its merits is respectfully requested.

In view of the foregoing amendments and remarks, Applicant respectfully requests favorable reconsideration and allowance of the present application.

Applicant's undersigned attorney may be reached in our New York Office by telephone at (212) 218-2100. All correspondence should continue to be directed to our address listed below.

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